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IN THE CLAIMS:

1. - 18. *cancelled*

19. *(currently amended)* A method comprising [The method of claim 1, wherein the common neighborhood is determined] :

determining a common neighborhood of users sharing a common activity from a plurality of users by

creating a set H of triples (b,c,v) where b,c, and v are vertices;

sampling randomly a subset of H of a specified size into a set H';

creating a set C of points (a,b) that are a projection of a first two vertices of each triple in set H';

calculating a number of occurrences, N(a,b), for each pair of vertices within the set C; and

sorting the C nondecreasingly by N(a,b), wherein the set C of points (a,b) represents the users in a common neighborhood, and the set E of edges represents the activities of the users within the common neighborhood; and

predicting for a user in the common neighborhood of users a potential activity from the activities of at least one other user in the common neighborhood of users.

20. *(currently amended)* The method of claim 19, wherein the random sampling is determined by:

creating an adjacency adjaceny-list E';

calculating a number of arcs connected to each vertex in a set V of vertices;

calculating a prefix sum of a number of pairs of incident arcs N(a) for each node a up to and including a;

generating random numbers uniformly from a set $[1...N]$;

sorting the generated random numbers into a list R;

initializing a vertex index variable v to 1 and the set H' to the empty set;

incrementing the vertex index variable v by 1 until: $N(v-1) < r <= N(v)$ for each random number r in the list R;

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selecting a vertex, a, from a set of vertices A(v) connected to vertex v;

selecting a vertex, b, from a set of vertices A(v)-{v} connected to vertex v;

adding a triple (a,b,v) to the set H'; and

determining the set H' when the vertex variable v is greater than a number of nodes N.

21-24. cancelled

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~~25~~. *(currently amended)* <u>A method comprising</u> [The method of claim 21, wherein the common neighborhood is determined]<u>:</u>

<u>determining a common neighborhood of documents sharing at least one common reference</u> by

creating a set H of triples (b,c,v) where b,c, and v are vertices;

sampling randomly a subset of H of a specified size into a set H';

creating a set C of points (a,b) that are a projection of a first two ~~elements~~ <u>vertices</u> of each triple in set H';

calculating a number of occurrences, N(a,b), for each pair of vertices within the set C; and

sorting the C nondecreasingly by N(a,b), wherein the set C of points (a,b) represents the ~~users~~ <u>documents</u> in a common neighborhood, and the set E of edges represents the ~~activities~~ <u>references</u> of the ~~users~~ <u>documents</u> within the common neighborhood<u>; and</u>

<u>predicting for a document in the common neighborhood of documents, a potential reference from the references of at least one other document in the common neighborhood of documents.</u>

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~~26~~. *(currently amended)* The method of claim ~~25~~, wherein the random sampling is determined by:

creating an <u>adjacency</u> ~~adjaceny~~ list E';

calculating a number of arcs connected to each vertex in a set V of vertices;

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calculating a prefix sum of a number of pairs of incident arcs N(a) for each node a up to and including a;

generating random numbers uniformly from a set [1...N];

sorting the generated random numbers into a list R;

initializing a vertex index variable v to 1 and the set H' to the empty set;

incrementing the vertex index variable v by 1 until: $N(v-1) < r <= N(v)$ for each random number r in the list R;

selecting a vertex, a, from a set of vertices A(v) connected to vertex v;

selecting a vertex, b, from a set of vertices A(v)-{v} connected to vertex v;

adding a triple (a,b,v) to the set H'; and

determining the set H' when the vertex variable v is greater than a number of nodes N.

27. - 44. *cancelled*

45. *(currently amended)* An apparatus comprising [The apparatus of claim 27, wherein the common neighborhood is determined] :

means for determining a common neighborhood of users sharing a common activity from a plurality of users by:

means for creating a set H of triples (b,c,v) where b, c, and v are vertices;

means for sampling randomly a subset of H of a specified size into a set H';

means for creating a set C of points (a,b) that are a projection of a first two elements of each triple in set H';

means for calculating a number of occurrences, N(a,b), for each pair of vertices within the set C; and

means for sorting the C nondecreasingly by $N(a,b)$ wherein the set C of points (a,b) represents the users in a common neighborhood , and the set E of edges represents the activities of the users within the common neighborhood.

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~~46.~~ 6. *(currently amended)* The apparatus of claim ~~45~~ 5, wherein the means for sampling randomly comprises:

means for creating an <u>adjacency</u> ~~adjaceny~~ list E';

means for calculating a number of arcs connected to each vertex in a set V of vertices;

means for calculating a prefix sum of a number of pairs of incident arcs N(a) for each node a up to and including a;

means for generating random numbers uniformly from a set [1...N];

means for sorting the generated random numbers into a list R;

means for initializing a vertex index variable v to 1 and the set H' to the empty set;

means for incrementing the vertex index variable v by 1 until: $N(v-1) < r <= N(v)$ for each random number r in the list R;

means for selecting a vertex, a, from a set of vertices A(v) connected to vertex v;

means for selecting a vertex, b, from a set of vertices A(v)-{v} connected to vertex v;

means for adding a triple (a,b,v) to the set H'; and

means for determining the set H' when the vertex variable v is greater than a number of nodes N.

47. - 50. *cancelled*

~~51.~~ 7. *(currently amended)* <u>An apparatus comprising</u> [The apparatus of claim 47, wherein the common neighborhood is determined]<u>:</u>

<u>means for determining a common neighborhood of documents sharing at least one common reference</u> by

means for creating a set H of triples (b,c,v) where b,c, and v are vertices;

means for sampling randomly a subset of H of a specified size into a set H';

means for creating a set C of points (a,b) that are a projection of a first two ~~elements~~ <u>vertices</u> of each triple in set H';

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means for calculating a number of occurrences, N(a,b), for each pair of vertices within the set C; and

means for sorting the C nondecreasingly by N(a,b), wherein the set C of points (a,b) represents the ~~users~~ documents in a common neighborhood, and the set E of edges represents the ~~activities~~ references of the ~~users~~ documents within the common neighborhood; and

means for predicting for a document in the common neighborhood of documents, a potential reference from the references of at least one other document in the common neighborhood of documents.

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52. *(currently amended)* The apparatus of claim 51, wherein the means for sampling randomly comprises:

means for creating an adjacency ~~adjaceny~~ list E';

means for calculating a number of arcs connected to each vertex in a set V of vertices;

means for calculating a prefix sum of a number of pairs of incident arcs N(a) for each node a up to and including a;

means for generating random numbers uniformly from a set [1...N];

means for sorting the generated random numbers into a list R;

means for initializing a vertex index variable v to 1 and the set H' to the empty set;

means for incrementing the vertex index variable v by 1 until: N(v-1) < r <= N(v) for each random number r in the list R;

means for selecting a vertex, a, from a set of vertices A(v) connected to vertex v;

means for selecting a vertex, b, from a set of vertices A(v)-{v} connected to vertex v;

means for adding a triple (a,b,v) to the set H'; and

means for determining the set H' when the vertex variable v is greater than a number of nodes N.

53. - 54. *cancelled*

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